BIOLOGICAL EVALUATION OF FOREST INSECT CONDITIONS ON THE BOISE NATIONAL FOREST DURING 1968

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Forest Insect Conditions on the
Boise National Forest
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Information for this report has been compiled from aerial and ground detection surveys, and on-the-ground biological evaluations of specific infestation centers. Verbal and written reports from your staff materially aided in pinpointing potentially serious insect threats to timber resources.

The Douglas-fir beetle continued epidemic trends throughout Douglas-fir stands with greatest activity concentrated on the southern half of the Forest. Continued Ips pini activity was detected in ponderosa pine stands; however, the number of groups, and trees killed per group, were less than observed in 1967. Overall, mountain pine beetle attacks in lodgepole and ponderosa pine were at a fairly low level. The persistent mountain pine beetle infestation in second-growth ponderosa pine southeast of Cascade continued epidemic trends and spread to lands owned by Boise Cascade Corporation. Movement is in an easterly direction, but as yet does not involve forest lands. Western pine beetles killed small groups of mature to overmature ponderosa pines in widely scattered locations; however, no epidemic centers were detected. Spruce budworm activity in the Primitive Area decreased slightly, but there was a shift toward more intensive defoliation in the affected stands. Tussock moths severely defoliated brush species in Town Creek Plantation. When the preferred broadleafed host species were depleted, larvae caused moderate damage to young ponderosa pines. This defoliator has the potential to cause increased damage to young pines in 1969. Tent caterpillar damage to bitterbrush and other browse species occurred in widely scattered locations.

DOUGLAS-FIR BEETLE - Dendroctonus pseudotsugae Hopk.

Douglas-fir stands in southern Idaho have periodically undergone epidemics of the Douglas-fir beetle. Buildups, for the most part, are attributable to natural or man-induced factors, or combinations thereof. In recent years natural phenomena have contributed to rising Douglas-fir beetle populations. Winter storms of 1964-1965 produced unseasonable rains which caused rapid snowmelt. Accompanying strong winds followed by heavy wet snows felled hundreds of Douglas-firs. These trees became prime hosts in which the beetle developed. Annual increases in tree killing have occurred since that time.

This year's evaluations revealed scores of new attack centers ranging from three to five newly attacked trees to every one killed last year. All indications point toward continued high level tree mortality unless natural controls such as adverse weather, parasites, and predators slow the beetle's impetus.

Group killing of Douglas-fir in the Bogus Basin ski area was less than last year. This undoubtedly was a result of salvage logging, and felling and

burning. This year new centers of activity were found and a logging contract was let to remove infested trees. Douglas-fir in this area is heavily mistletoe-infected and consists of low vigor, older age class stands that are highly susceptible to beetle attack. The current moderate level of beetle activity is expected to continue through 1969, and it may be necessary to continue maintenance control by logging until beetle populations decline.

Ips pini (Say)

During the 1966-67 field seasons, Ips pini caused considerable damage to small diameter ponderosa pines throughout the Emmett, Idaho City, Garden Valley, and Cottonwood Ranger Districts. Historically, these engraver beetles do not precipitate epidemic infestations unless several factors favor their development. On occasion when these factors occur in favorable combinations, Ips beetle activity becomes pronounced and results in serious losses of standing timber. This was the case in the 1966-67 field seasons when ideal development conditions characterized by periods of high temperatures, low humidity, and low precipitation rates made rapid Ips buildups possible. Almost without exception, wherever green logging slash was left in place during the past three field seasons, Ips developed rapidly and caused mortality to standing trees nearby. Several evaluation trips were made on the Emmett Ranger District where proposed sales for next year are in the process of being finalized. It was recommended that, wherever possible, slash be tractor piled and these piles be treated by mistblown applications of Lindane shortly before beetle emergence. It is recognized that all logging slash cannot be treated in this manner. An exception, for example, would be cable logging where little or no tractor piling is done. We do feel, however, there is a good possibility of reducing Ips threats to standing trees by using the aforementioned procedures whenever and wherever possible.

Last August unseasonal rainstorms occurred throughout southern Idaho. These storms coincided with the emergence of third generation adults and due to the longevity of the storms it appears they caused considerable disruption in third-generation adult flights. The ensuing 2-week rainy period appeared to have slowed down Ips activity in general. Personnel on the Emmett Ranger District in coordination with the fire staff took advantage of the rains and burned Ips infested ponderosa pine slash. This expeditious action undoubtedly will go a long way in reducing overall Ips populations in the Ola Slope and Kennedy Sale areas.

Comment should be made with regard to a thinning operation conducted on the Idaho City Ranger District in the fall of 1967. During September approximately 130 acres were contract thinned. Felled trees were left in place and no piling was associated with this operation. Biological evaluations showed no beetle buildup prior to snowfall and late spring evaluations did not reveal any Ips activity. During the third week of June, reevaluation of the area was made and Ips beetles had made relatively heavy attacks in

the felled trees. The area was kept under close surveillance for the rest of the summer and no standing tree attacks were associated with the early summer buildup of Ips. The point here is that even though Ips beetles made attacks into the material that was thinned in September, the moisture content was reduced to a level which was unfavorable for brood development. With the high incidence of Ips beetle activity that has been encountered in this area for the last three years, we are recommending that future thinning be delayed until as late in the summer as possible. Thinning can be safely conducted then through late December. Experience has shown that trees cut after January 1 retain sufficient moisture to permit Ips to successfully complete broods in the spring.

Periodically, we are questioned about midsummer manipulation of Ips in slash. In most cases, Ips damage to standing trees can be held at a minimum if continuous green slash is provided from July 1 through October 30. Also, each new successive cutting unit would have to be close enough to attract and trap emerging adults. No set distance can be placed on proximity of units to each other as timber age class, amount of residual slash, and terrain influence how far emerging adult beetles will travel to attack. In other words, the closer the better! Past experience has shown that attempts to attract beetles is hazardous if cutting areas are further than one-half mile apart.

Undoubtedly, the greatest hazard from Ips activity occurs when cutting starts early in the spring, progresses through midsummer, and is terminated. Heavy populations build up in slash, emerge, then reinfest new slash. This progression continues until the end of cutting. As beetles emerge and no new slash is available, standing trees are sought out and attacked. This situation could be virtually eliminated if continuous green slash was made available through October. At that time, Ips infested material should be burned, if possible, and the populations destroyed. If burning is impractical and infested material must be left on the ground, care should be taken to assure that no fresh slash is provided between January 1 and July 1. Ips emerging in the spring will die unless they are provided with slash which is moist enough to rear brood. If broods are found alive in slash in late June, standing trees can be protected only if a particular effort is made to provide slash for July flights followed by continuous fresh slash through October.

MOUNTAIN PINE BEETLE - Dendroctonus ponderosae Hopk.

For the most part, mountain pine beetle activity in ponderosa and lodgepole pine stands remained at a fairly low level during the 1968 field season. The small epidemic center on the Mountain Home Ranger District in Castle Creek stayed at about the same level as last year and has shown no significant increase in activity. Another infestation center was found in Whiskey Jack Creek involving approximately 400 trees. Work scheduling did not permit on-the-ground evaluation of this infestation and if it persists, we

will get in tothe area next year. Elsewhere, small group infestations were found in Tripod Meadows of the Emmett Ranger District and small groups of lodgepole pine were killed along the North Fork of the Payette River south of Cascade primarily on private land. These infestations appear to be occurring in mature and overmature age class trees of apparently low vigor. Though they are new areas of attack, they do not present an epidemic threat at the present time. Scattered tree killing in lodgepole pine was detected on the North Fork of the Boise River near the Graham landing strip where approximately three to ten trees per group were recorded. In the past, we have had tree killing at about this level throughout the North Fork of the Boise River drainage and as such the current infestations are not cause for alarm.

The persistent mountain pine beetle infestation in second-growth ponderosa pine southeast of Cascade remains at a fairly high level this year. Aerial detection surveys revealed approximately three to five thousand trees were killed last year with attacks being concentrated in the smaller d.b.h. classes.

Until this year the infestation had remained almost static with regard to movement into surrounding areas. Last year's flights which produced this year's feders showed that the beetles moved in a southeasterly direction on to lands owned by Boise Cascade Corporation. This encroachment is toward the Forest boundary; however, a considerable distance remains before the beetles get on forest land. Our evaluation of the area shows no reduction in brood density and all factors point toward a continued high level of infestation through 1969.

We have been contacted by the State Department of Public Lands and Boise Cascade Corporation. Both parties feel that the infestation is growing to intolerable limits and are planning to survey the area the first week in December. We have been requested to furnish technical assistance for the survey. Depending on survey results, there is a possibility that control may be undertaken in this area during the spring of 1969. If this is the case, it should materially reduce the threat to forest lands. Information as to the results of the survey and the possibility of a subsequent control operation will be furnished you at a later date.

SPRUCE BUDWORM - Choristoneura fumiferana complex

An upward trend in defoliation intensity by spruce budworm was observed this year in the Primitive Area of the Forest. Unlike the population resurgence detected on neighboring Forests, the acreage within the Marble Creek infestation has not perceptively increased. Elsewhere, small spot defoliation centers were detected in Pistol, Garden, and Indian Creeks. Defoliation intensities were light and their future course of action is a matter of conjecture at this time. The following table depicts budworm defoliation intensity by acreage for the past six years.

DEFOLIATION INTENSITY (in acres)
ACREAGE BY YEAR

Year	Light	Moderate	Heavy	Total
1963	2,400	10,080	43,680	56,160
1964	20,800	28,800	24,000	73,600
1965	--	--	60,200	60,200
1966	56,800	2,600	--	59,400
1967	25,100	3,800	--	28,900
1968	12,440	11,560	3,680	27,680

It is interesting to note that decreasing defoliation intensities have been evident since 1966. This was largely due to hard freezes that coincided with fall 1965, and spring 1966 first and second instar larval migrations. Low temperatures at those periods of time presumably caused heavy larval mortality and severely damaged new buds in which the young budworms develop.

This year aerial detection crews observed a shift from light to moderately heavy defoliation in the Primitive Area infestation. Even though a slight decrease in total acres affected was mapped in, defoliation intensity increased. Also, two new centers of activity were detected indicating possible resurgence of this persistent pest.

This particular area of budworm activity has in the past closely paralleled population trends on the neighboring Challis, Payette, and Salmon Forests. At one time these four Forests had a combined contiguous infestation well in excess of 2,000,000 acres. Natural forces, including parasites, predators, and adverse weather conditions, plus periodic suppression operations reduced populations to a fairly low level in 1967. This year defoliation intensities increased and new centers of activity were recorded throughout the 4-Forest complex, the Boise not being excepted. Information gathered from ground and aerial surveys points toward increasing spruce budworm activity in 1969.

TUSSOCK MOTH - Hemerocampa sp. possibly vetusta (Bdv.)

The predicted accelerated defoliation to Ceanothus sp. in the Town Creek Plantation became a reality in 1968. Early in the spring, newly hatched larvae fed vigorously on the underside of old growth Ceanothus leaves. With the advent of warmer weather, it was apparent that highly concentrated populations were consuming vegetation as rapidly as it grew. Defoliation intensity was so heavy on broadleaf bushes, such as Ceanothus, Purshia, Salix, and Prunus, that by the third and fourth larval instars, mass migration to young ponderosa pines was observed. Light to moderate defoliation was sustained by the plantation stock until a native polyhedral virus caused heavy larval mortality.

Egg mass surveys this fall revealed a decreased number of masses per bush; also, individual masses averaged less than 100 eggs, which is a decrease from the usual average of 150 per mass. This decrease can reasonably be attributed to effects of the virus. Just what this means in terms of hatching success next spring cannot be predicted at this time.

Even though eggs per mass are fewer in number this year, we have the problem of heavy egg mass deposition on the plantation pine. In past years sufficient foliage has kept larval populations more or less confined to the broadleafed species. Tussock moth development, feeding, and oviposition, therefore, were largely on these species. This year late larval instars migrated to pines and pupated on the trees' needles. Emerging females, which are wingless, mated on the trees and generally laid their eggs "in place." As a consequence, the bulk of next year's potential populations are concentrated on the pines. As the young larvae emerge next spring, there is no doubt that they will feed to some extent on the pines. The big question is: Will they migrate back to their preferred host plant, Ceanothus sp. or continue to defoliate the trees? If the latter is true, there is a possibility that direct chemical or virus suppression measures will have to be undertaken. At this point recommendations for or against suppression cannot be made.

Due to the potentially serious nature of this problem, we plan to keep the Town Creek Plantation under close biological surveillance next spring. We will be in close contact with District personnel on this problem and will advise them of our findings and recommendations as tussock moth populations develop.

Elsewhere, light defoliation of broadleafed plants occurred from Idaho City eastward in the Mores Creek and feeder drainages. Tussock moth populations were light this year; however, this represents a much greater area of infestation than recorded in past years. What course these new infestations will take is not known at this time.

TENT CATERPILLAR - Malacosoma sp.

Scattered, moderate defoliation of bitterbrush occurred in the North Fork of Cottonwood Creek. This was the first time in several years that this pest has shown a tendency to increase on browse plants. Due to the rapid fluctuations in populations and low egg mass counts from the area this fall, we feel that the infestation is not economically significant.

If there are any questions concerning information in this report, please contact the Boise Zone Office.

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